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**PRIORITY DOCUMENT**

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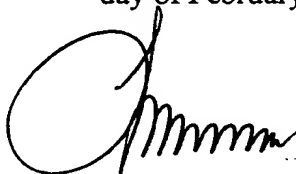
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I, KIM MARSHALL, MANAGER EXAMINATION SUPPORT AND SALES,  
hereby certify that the annexed is a true copy of the Provisional specification as filed  
on 29 January 1997 in connection with Application No. PO 4847 for a patent by  
SECURENCY PTY LIMITED.

I further certify that the annexed specification is not, as yet, open to public inspection.

WITNESS my hand this Tenth  
day of February 1998



KIM MARSHALL  
MANAGER EXAMINATION SUPPORT AND  
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**AUSTRALIA**  
*Patents Act 1990*

**PROVISIONAL SPECIFICATION**

**FOR THE INVENTION ENTITLED:**

**"Printed Matter Producing Reflective Intaglio Effect"**

**Applicant:**

**SECURENCY PTY LTD**

<b>AUSTRALIAN</b>	
PROVISIONAL NO.	DATE OF FILING
P04847	29 JAN. 97
PATENT OFFICE	

The invention is described in the following statement:

## PRINTED MATTER PRODUCING REFLECTIVE INTAGLIO EFFECT

### Field of the Invention

This invention relates to printed matter, including banknotes, security  
5 documents and devices, and all other printed matter.

### Background of the Invention

The printing industry is constantly looking for printing techniques which  
produce printed matter which offers additional security or which is visually  
appealing in various applications.

10 In the security printing industry, printed matter which exhibits an effect when  
visually inspected under various light conditions, but which is not capable of  
replication using known duplicating methods, such as photocopying or scanning is  
highly advantageous.

The introduction of banknotes printed on polymer substrates has introduced  
15 a further dimension to the security printing industry, and the present invention  
provides a further improvement in banknotes and other security devices exhibiting  
the abovementioned desirable effect.

### Summary of the Invention

The invention provides a printed document or other device comprising a  
20 substrate having a surface to which printed matter is applied, a reflective or brightly  
coloured layer applied directly or indirectly to said surface, and an intaglio print  
applied to said reflective or brightly coloured layer.

By applying an intaglio print on a reflective or brightly coloured layer, the  
intaglio print is significantly enhanced and an optically variable image is produced  
25 when the document is viewed under different lighting conditions thereby introducing  
an optically variable effect of benefit in security applications.

In one form of the invention, the substrate is a polymer film and preferably  
a laminated film of the type used in the production of Australian banknotes.

In certain applications or areas of the document, the reflective or brightly  
30 coloured layer can be applied directly to the substrate or film, which can have its

own reflective effect, thereby intensifying the reflective properties of the reflective or brightly coloured layer. In other applications, an opaque ink layer may be first applied to the surface of the substrate and the reflective or brightly coloured layer applied to the opaque layer.

5 Both the reflective or brightly coloured layer and the opaque layer are preferably applied to the substrate by the Gravure printing process, although the reflective or brightly coloured layer may comprise a metallised foil or a brightly coloured foil which is laminated or adhesively applied to the surface of the substrate.

The invention also provides a method of producing a printed document or  
10 other device including a substrate comprising the step of applying an intaglio print to a reflective or brightly coloured layer on said substrate.

In one form of the invention, the reflective or brightly coloured layer is an ink layer applied by the Gravure printing process. Alternatively, the reflective or brightly coloured layer comprises a reflective or brightly coloured foil which is  
15 laminated or adhesively applied to the surface of the substrate.

In a particularly preferred form of the invention, the reflective or brightly coloured layer is applied to an opaque layer which has been applied to the substrate.

#### Description of Preferred Embodiment

In a presently preferred form of the invention, a thin polymer substrate  
20 comprising laminated polypropylene sheets of the type currently used to produce Australian polymer banknotes firstly has an opaque layer applied to both sides of the substrate by the Gravure printing process, following which a reflective or brightly coloured layer of ink is applied also by the Gravure process.

The ink can comprise any suitable ink which produces a reflective or brightly  
25 coloured effect. Suitable inks include the following pigments blended at a 30% to 70% w/w concentration in clear varnish suitable for Gravure application.

Product Name:	Bronze Powder Resist Rotoflex Brilliant Rich Pale Gold
Product Description:	Flake oxidation resistant metal powder based on a copper-zinc-alloy. (ca 85% Cu, 15% Zn)
30 Particle Size:	<45 $\mu\text{m}$

Product Manufacturer: ECKART-WERKE GmbH & Co

Supplied by: Hoechst Australia Limited

and

Product Name: Aluminium Powder Super Lining GGT

- 5 Product Description: Aluminium Powder (Aluminium based on H-A1 99,5%)  
Supplier and Manufacturer as above.

Printed matter is then applied to the surface of the reflective or brightly coloured layer by the intaglio process to produce a print having raised regions. In the present example, the intaglio print can comprise the same prints which are  
10 currently applied to Australian polymer banknotes, and these prints are significantly enhanced by the reflective or brightly coloured background and an optically variable image is produced when the intaglio print is viewed under different lighting conditions.

The reflective effect of the reflective or brightly coloured layer complements  
15 the image applied by the intaglio process since the intaglio process transfers a raised print to the substrate, and when such a print is applied to the reflective surface, a novel effect is achieved. An image can be observed by viewing the intaglio image at different angles. If the same intaglio image is printed on a non-reflective substrate, the same effect will not be achieved. The novel image effect may be  
20 explained by the following factors:

- When the raised intaglio print is viewed at a specific angle the walls of the intaglio lines hide the background print. The reflective nature of the substrate intensifies the distinction between the intaglio and reflective substrate revealing the novel image.
- 25 • The flat/smooth nature of polymer substrate pronounced by a reflective type printed surface, in addition to the raised surface of the intaglio image intensifies both these properties.

As mentioned above, the reflective or brightly coloured ink can be applied directly to the surface of the polymer substrate since the substrate has its own  
30 reflective effect, and this intensifies the reflective effect produced by the reflective

or brightly coloured ink layer. If the reflective or brightly coloured ink is applied without an opaque layer, the image can be viewed in transmission and still provide a beneficial effect. Alternatively, if the reflective or brightly coloured ink layer is applied in a region which has been printed on the other side, the printed image will still be enhanced by the underlying reflective layer.

As mentioned above, the reflective ink layer can be replaced by a reflective foil or other film which is laminated or adhesively applied to the substrate and a similar effect is achieved in either case. Suitable reflective foils include those that are applied onto the substrate by hot stamping techniques. These foils typically comprise of a carrier film, a release layer, a metallised layer and an adhesive. Application of the foils is achieved by the hot stamping technique where the foil is adhered onto the substrate at a temperature of, but not limited to, 130°C and high compressive pressure, so that the adhesive is activated and the carrier film is released.

By applying an intaglio print to a reflective or brightly coloured substrate, the security features of the intaglio image are substantially enhanced, resulting in greater distinction and an image. Both the optically variable intaglio effect and the reflective/glossy nature of the substrate are difficult to replicate by standard duplicating methods, such as colour photocopying or scanning, and the effect produced is aesthetically pleasing.

It will also be appreciated that various modifications and alterations may be made to the system described above without departing from the scope and spirit of the invention.